Attachment 3

Capital expenditure

Access arrangement information

ACT and Queanbeyan-Palerang gas network 2021–26

Submission to the Australian Energy Regulator

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evoenergy

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3. Capital expenditure

Key points

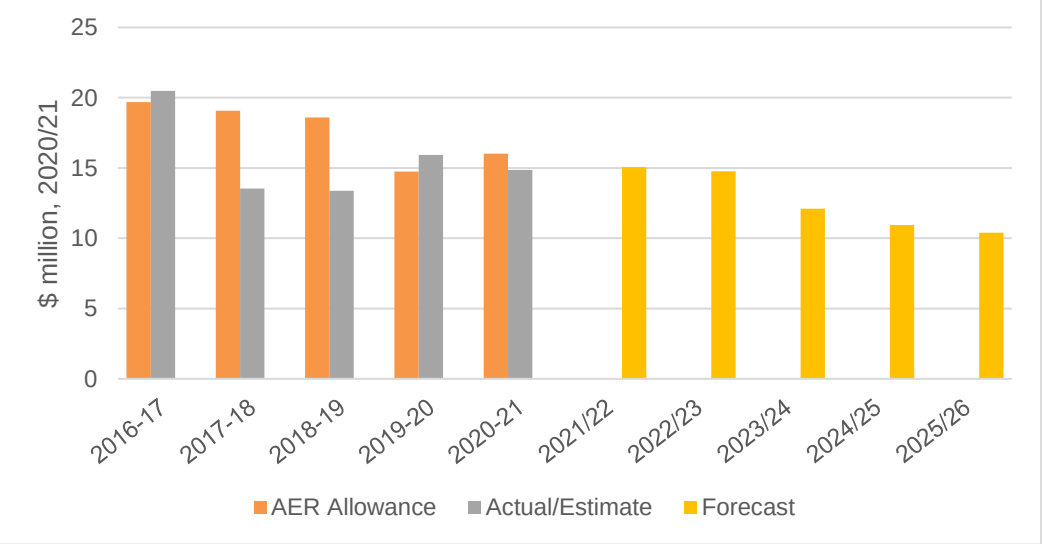
Evoenergy's capex program is focused on investments that ensure the continued safe, reliable, and secure delivery of gas to consumers in the ACT and Queanbeyan–Palerang.

Evoenergy's expenditure over the current (2016–21) access arrangement period is 13 per cent lower than the AER's capex allowance as a result of significant network renewal and augmentation projects being cancelled or deferred. This is due to a factors, such as a rapidly changing industry environment, that were not anticipated at the time of the last access arrangement review.

Evoenergy's forecast capex over the 2021–26 access arrangement period is significantly below both actual and allowed capex in the current (2016–21) period (18 per cent and 28 per cent, respectively). This is mainly the result of reducing market expansion capex forecasts to considerably below historical levels, reflecting a prudent assessment of the general direction of ACT Government policy and independently assessed connection forecasts (Attachment 7).

The figure below compares Evoenergy's forecast capex for 2021–26 with the AER's allowance and actual capex for the current (2016–21) period.

Allowed, actual and forecast capex



3.1 How our capital program will benefit customers

We have developed our capital program to meet the needs of customers for a safe and reliable network, and affordability in the face of an uncertain future. Our capital program is best viewed as a package of projects, each of which is tailored to address consumer and regulatory requirements. To get a better picture of what the expenditure involves and

how it addresses consumer needs, it is helpful to frame the program according to distinct purposes, under the categories set out in Figure 3.1.

Figure 3.1 Capital expenditure categories

Market expansion

This relates to spending on new services, mains, and meters to connect new customers. This includes new homes, conversion of existing homes to gas, medium density and high rise residential, and commercial/ ndustrial customers. Market expansion capex lowers costs for all consumers by allowing fixed costs to be spread over a larger number of consumers.

Capacity development

This includes expenditure on services, equipment, and facilities to improve the integrity of services provided to consumers, ensuring the quality and reliability of supply. In particular, the gas network may require further strengthening in order to ensure continuity of supply to any greenfield developments in the Canberra region.

Stay in business

This involves the upgrading of network infrastructure and replacing assets, such as inaccurate meters and deteriorated mains, that are no longer performing. An example of this is the rectification of inlet piping to improve safety of services, and the replacement of meters as they reach the end of their economic lives to ensure that metering remains accurate and within regulatory requirements.

Non-system capex

This involves spending on technology services and facilities which enhance or maintain Evoenergy's capabilities to deliver gas pipeline services. **there There will be no expenditure in this category in the 2021–26 period**. Examples of previous expenditure include developing Evoenergy's Geographic Information System (GIS) through connection of data to mobile devices (including use of GPS integration at the point of data capture).

In the Overview to this access arrangement information, we discuss the uncertain future of the gas network. The ACT is the first jurisdiction in Australia to legislate for net zero greenhouse gas emissions (by 2045). The government's climate change strategy 2019–25 has resulted in the end of mandated gas reticulation in new ACT developments, increased promotion of electric alternatives to gas appliances, and flagged the government's intention to develop a plan by 2024 to phase out all gas connections to achieve zero emissions.

In response to these changes, we have optimised our investment strategies to maintain flexibility in the face of uncertainty. The capital program proposed in the Evoenergy GN21 draft plan reflected a constrained approach. It had been informed by feedback from our consumer engagement which included Citizens' Jury workshops where jurors considered the uncertainty facing the gas network and reported their views on options for the future (see Attachment 1 regarding findings of Evoenergy's consumer engagement).

The overall direction from our customers is to constrain investment given the uncertainty our gas network faces. Accordingly, Evoenergy's GN21 draft plan capex proposal did not provide for connections in new suburbs and excluded significant augmentation and capacity development projects that would otherwise have been required. This includes avoiding costs of $6 million for upgrading the Phillip Primary Regulation Station (required to ensure reliability and security of supply as the network expanded), and further mains expansion in the Molonglo Valley area.

Subsequent to the publication of the GN21 draft plan, Evoenergy has further reduced connections expenditure in its capex proposal. Section 3.1.1 of this attachment summarises the relevant inputs we received from stakeholders on our capital program and outlines how we have considered feedback in developing the capex forecast for this access arrangement proposal.

The key theme of our investment program is to efficiently maintain the safety and integrity of the existing gas network. It includes projects where the customer benefits will be realised within short timeframes and seeks to constrain expenditure to ensure customers benefit from lower bills.

3.1.1 Issues on proposed capex raised in consumer engagement

The issues raised in submissions to our GN21 draft plan mainly concerned our approach to market expansion, in particular, allowing capex for connecting new dwellings in established areas of the ACT and in NSW. Table 3.1 summarises views received.

Table 3.1 Issues raised by stakeholders on Evoenergy's GN21 draft plan capital program

Stakeholder	Comments on GN21 draft plan capital program
ACTCOSS	Broadly agrees with our strategy of not reticulating gas in new suburbs, although it recommended that we provide more clarity as to whether developers would continue to install gas connections in new suburbs now that they are not mandated.
Better Renting	No justification to warrant any form of market expansion. Concludes that consumers will benefit from a lower revenue requirement due to a smaller Regulated Asset Base, and new households will benefit from being all electric. In addition, there should be no new market expansion into multi-unit apartments in the ACT, as they will be harder to electrify in the future.
Consumer Challenge Panel	Agrees with the general direction in the Draft Plan that it is in the best interests of consumers to limit capital investment. However, the CCP considers there is no justification to warrant any market expansion in the ACT due to the current direction of ACT government policy. For NSW the CCP notes that while the net zero emissions target is an aspirational target, many aspirational targets are likely to be converted to legislated targets. The CCP considers that without more certainty on hydrogen/biogas feasibility, market expansion capex will create stranded asset risk and so is inconsistent with a 'no regrets' approach.
Conservation Council	Notes that Evoenergy is waiting for policy certainty from the ACT government, but nevertheless finds it problematic that the Draft Plan allows for expansion within existing suburbs. It is also sceptical of the potential to use the network for alternative emissions free hydrogen or biogas in the future.

Evoenergy has taken account of stakeholder feedback with respect to government policy and the possibility of further market expansion. Government policy with respect to the

future of the ACT gas network is yet to be determined. The Overview to this access arrangement information explains Evoenergy's response to this policy uncertainty and why market expansion within the existing network footprint is a prudent approach in the circumstances.

3.2 Overview of actual and forecast capex

Table 3.2 sets out Evoenergy's forecast capex by category for each year of the 2021–26 access arrangement period. Most of the forecast capex relates to *Stay-in-business – meter renewal* and *Market expansion* capex and this mix is expected to remain stable over time.

Table 3.2 Forecast capex by category, 2021-26 access arrangement period

$ million 2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	Total
Market expansion	5.0	5.3	5.1	5.5	5.5	**26.3**
Capacity development	0.2	0.2	0.2	0.2	0.2	**0.9**
Stay-in-business – network renewal	4.0	4.8	2.0	1.7	0.4	**12.9**
Stay-in-business – meter renewal	6.0	4.5	4.9	3.6	4.4	**23.6**
Non-system	0.0	0.0	0.0	0.0	0.0	**0.0**
Gross capex	**15.2**	**14.9**	**12.2**	**11.0**	**10.5**	**63.8**
less capital contributions	0.1	0.1	0.1	0.1	0.1	**0.5**
Net capex	**15.1**	**14.8**	**12.1**	**10.9**	**10.4**	**63.3**

*May not sum due to rounding.

Figure 3.2 compares Evoenergy's forecast capex for the 2021–26 access arrangement period with actual and allowed capex in the current (2016–21) period. It shows that forecast capex is significantly below both actual (18 per cent lower) and allowed (28 per cent lower) capex for the current (2016-21) period. As well, forecast capex is 4.4 per cent lower than proposed in the GN21 draft plan, mainly driven by reassessment of the impact of ACT climate change strategy on the number of connections in existing areas of gas reticulation in the ACT.

Figure 3.2 Capex allowance, actual and forecast

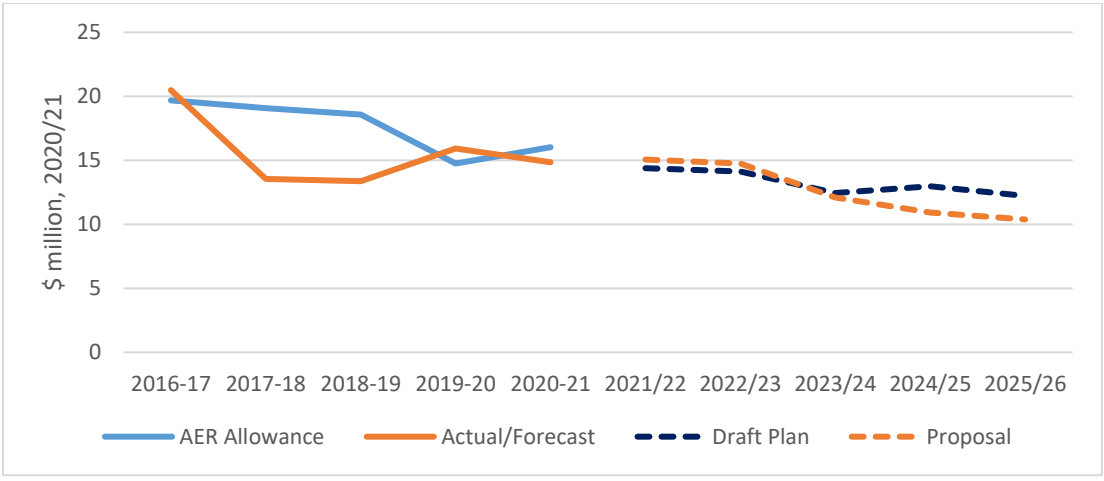


Figure 3.2 also shows that Evoenergy has spent around 13 per cent less than the AER's capex allowance for the current (2016–21) access arrangement period. A major underlying cause of this is a rapidly changing market environment that was not anticipated at the time of the last access arrangement review. This led to significant network renewal and augmentation projects being cancelled or deferred. Changes in the 2016–21 capital program that significantly contributed to Evoenergy's capex being below the AER's allowance include:

- **Cancellation of Watson PLS** – This project was forecast based on the assumption that the gas market would continue to expand and that full flow to the entire ACT gas market would need to be able to be achieved through Hoskinstown. However, given climate change policy and market conditions this is no longer likely to occur;
- **West Belconnen Secondary Main reduction of scope** – This project was reduced to a fraction of its anticipated size due to the announcement by the ACT Government and developers that Ginninderry would trial the first 'no-gas estate'. As a result, the secondary main was de-scoped to provide capacity only to potential commercial premises within Ginninderry and a contract customer. No new homes will be serviced with gas in Ginninderry;
- **Inlet Piping Rectification** – The forecast for this program was informed by input from shopping centre managements, in particular, to enable them align works with the timing of shopping centre upgrades to make savings and minimise disruption. For some centres, there were substantial delays compared to expected timing, and thus the rectification of remaining centres is expected to be completed in the 2021–26 access arrangement period.

Table 3.3 outlines Evoenergy's capital program for each capex category in the current and upcoming regulatory periods. It shows that Evoenergy's proposed capital program is significantly smaller due the large reduction in market expansion capex and minimal capacity development capex.

Table 3.3 Net capex by category, current 2016-21 and forecast 2021-26 period

$ million (2020/21)	AER allowance 2016-21	Actuals 2016-21	Forecast 2021-26
Market expansion	49.7	45.9	26.3
Capacity development	7.1	7.2	0.9
Stay-in-business - network renewal	17.0	8.2	12.9
Stay-in-business - meter renewal	18.2	17.4	23.6
Non-system	0.6	0.0	0.0
Gross capex	**92.6**	**78.7**	**63.8**
less capital contributions	4.5	1.7	0.5
Net capex	**88.1**	**77.0**	**63.3**

Note: Includes construction management fee, capitalised overheads, and labour cost escalation. May not sum due to rounding.

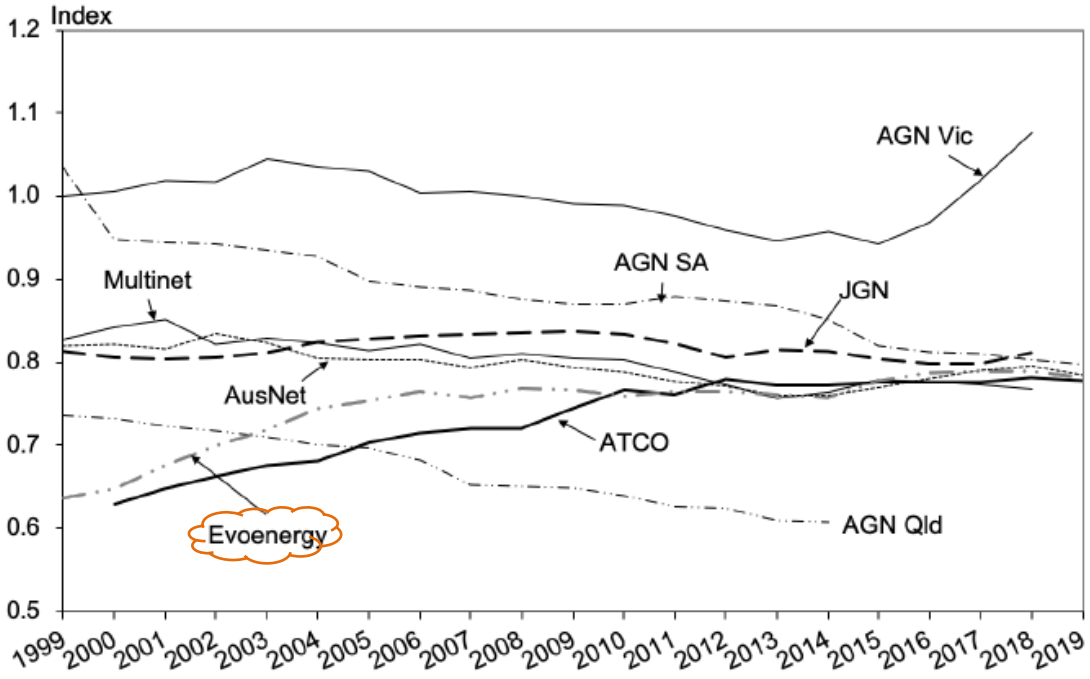
As no connections are forecast for new suburbs in the ACT, the large majority of what would otherwise be significant capacity development expenditure will no longer be required. In addition, Evoenergy is proposing no expenditure for non-systems capex as

we consider that our existing information systems and equipment continue to work well. Overall, customers will benefit considerably from the lower proposed capital expenditure.

The *Stay-in-business* capex forecasts reflect our continuing commitment to maintain safety and reliability of the network. It also reflects our desire to extract as much value for consumers as possible, such as in our existing meter replacement strategy, which aims to extend meter service lives via statistical sampling.

Evoenergy commissioned Economic Insights to benchmark costs relating to our gas business, which included developing Partial Productivity Indicators and undertaking a capital Partial Factor Productivity (PFP) study for Evoenergy's actual levels of capex for the period from 2009 to 2019. Figure 3.3 shows the historical performance of Evoenergy's multilateral capital PFP index against other gas network providers. It shows that, in recent years, Evoenergy's PFP index is largely consistent with most other gas businesses, having remained stable at around 0.8.

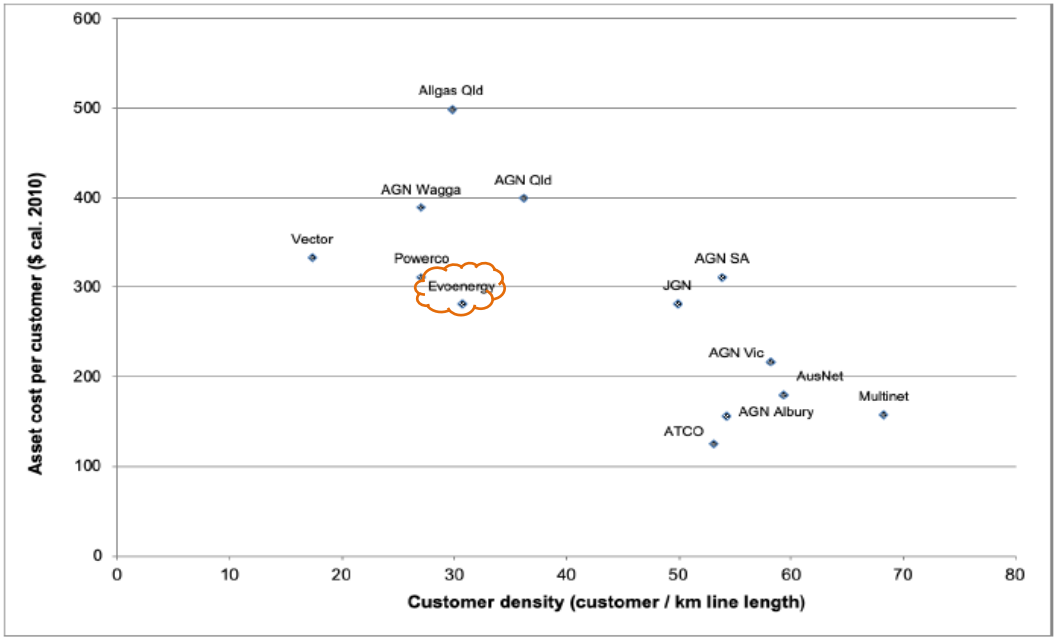
Figure 3.3 GDB multilateral Capital PFP indexes, 1999-2019



Source: Economic Insights 2019, Appendix 2.2 Relative Efficiency and Forecast Productivity, Growth of Evoenergy, p, 26.

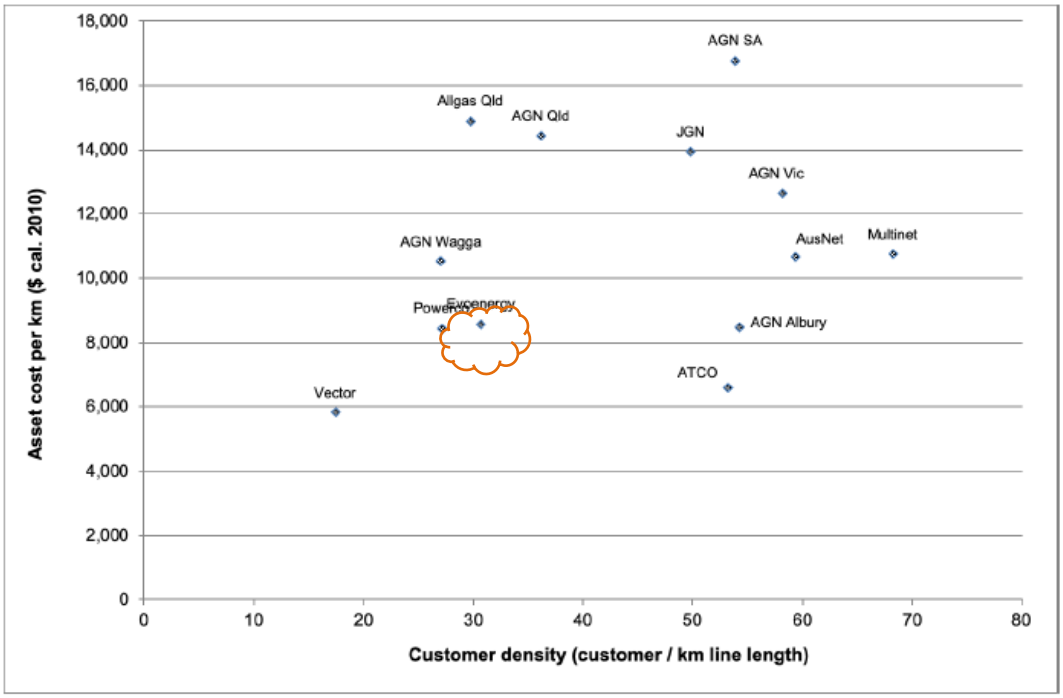
Figure 3.4 and Figure 3.5 show partial productivity indicators based on asset cost per customer and asset cost per mains kilometre. It shows that Evoenergy's asset base is relatively low for its low density levels (lower customer densities correlate to higher asset costs per customer due to economies of scale and vice versa). This remains true on both per customer and per mains kilometre bases.

Figure 3.4 Asset cost per customer relative to customer density



Note: Costs are average 2015-2019 or latest 5-year period. Asset cost is defined as real revenue minus real opex. **Source:** Economic Insights 2019, Appendix 2.2 Relative Efficiency and Forecast Productivity, Growth of Evoenergy, p, 26.

Figure 3.5 Asset cost per mains km relative to customer density



Note: Costs are average 2015-2019 or latest 5-year period. Asset cost is defined as real revenue minus real opex. **Source:** Economic Insights 2019, Appendix 2.2 Relative Efficiency and Forecast Productivity, Growth of Evoenergy, p, 26.

3.3 Capex forecasting approach

Evoenergy has forecast capex using the following methods:

- Connections and metering capex were forecast using volume and unit rate forecasts. These approaches are detailed in Appendix 3.5 and are implemented in Evoenergy's market expansion model (Appendix 3.2), meter replacement forecast model (Appendix 3.3), and meter replacement volume forecast model (Appendix 3.12).
- Project-based capex was forecast by identifying the required projects (for instance, where we have forecast constraints) given customer, regulatory, and network needs, and assessing the associated cost.[1]

Evoenergy's capex forecast has been subject to extensive internal review and approval processes throughout its development. The forecasts produced are reviewed in three stages — firstly at a project/program level; secondly, at an asset class level; and, thirdly, at a total program level. Further detail is provided in our Network Asset Management Plan (Appendix 3.4). The overarching regulatory framework for the assessment of efficiency and prudent of capex is provided under the Rules.

Unit rates and volume mix ratio assumptions for our market expansion and meter replacement capex are based on four-year historical averages, as approved by the AER in its recent final decision on Jemena Gas Networks 2020-25 Access Arrangement.[2] Each element of the program has been challenged and tested to determine whether the customer value exceeds the cost. The costs reflect efficient governance arrangements within Evoenergy's internal operations as well as outsourcing arrangements with Jemena Asset Management (JAM) (see RIN Attachment 13). JAM's approach to cost estimation and forecasting is detailed in Appendix 3.11, which supports the assumptions used by the project estimation models contained in the project documentation (Appendices 3.6 – 3.10). These processes provide a level of assurance that the capex incurred (and forecast) is efficient and prudent under the requirements of Rule 79(1).

Generally, Evoenergy's investments in connections and augmentation expenditure will deliver price reductions as that spend allows fixed costs to be spread over a larger customer base. In particular, our connections expenditure is outweighed by the consumer benefits (bill reductions) from additional revenue. The metering program ensures customers are accurately billed for their consumption as per the National Energy Retail Rules, while the remainder of the capex is focussed keeping the network safe and reliable (see section 3.5 below). Meter replacement capex is justified under Rule 79(2)(c), as being required to maintain the safety and integrity of services, as well as to comply with other jurisdictional obligations such as the Retail Market Procedures (NSW and ACT).

3.4 Market expansion capex

Market expansion capex typically includes new mains along streets and services to homes and businesses, as well as connecting new meters to measure how much gas is used. Market expansion capex is typically the largest part of our capital program.

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1 See Appendices 3.6 – 3.10 for project documentation supporting significant projects.

2 AER, Final Decision, Jemena Gas Networks (NSW) Ltd Access Arrangement 2020 to 2025, June 2020

Table 3.4 below shows the breakdown of market expansion capex for the current (2016–24) access arrangement period and upcoming (2021–26) period, as well as the AER's allowance for the current period.

Table 3.4 Market expansion capex by category excluding capital contributions

$ million (2020/21)	AER allowance 2016-21	Actuals/ Estimate 2016-21	Forecast 2021-26
Electricity to gas	8.8	1.7	0.6
New homes	25.1	28.0	8.5
Medium density/high rise	6.7	6.3	5.8
Industrial & commercial	8.9	11.3	11.4
Total	**49.5**	**47.2**	**26.3**

Note: Medium Density / High Rise and Industrial and Commercial figures include expenditure on Meter Data Loggers and Metreteks. May not sum due to rounding.

Our connections program benefits customers by ensuring equal and fair access to gas. Total forecast Market expansion capex is significantly lower than in the GN21 draft plan and historical trends. Much of this change reflects adjustments made to Evoenergy's connections forecast, as discussed in further detail in Attachment 7. A significant part of the market expansion capex (15 per cent) relates to developments in NSW, where no direct government action is being taken to transition away from gas.

Given the uncertainty facing the gas network, it is very difficult to forecast connections. The full implications of ACT Government policies, and broader trends towards electrification are unknown. We discuss our forecasts of gas use and customer numbers in detail in Attachment 7. In terms of forecasts of connections from new homes:

- the principal developer in the ACT, the Suburban Land Agency, has told us it will not be applying to connect gas in its new estates. We have reflected this information in our plans by assuming that we will not connect any new estates in the ACT;
- in NSW over the past 5 years, we have seen strong demand for gas as shown in NSW Government data on households being built or undergoing major renovations continuing to choose gas. We have forecast to continue receiving connection requests for homes in NSW. As submissions have noted, trends in the ACT could affect take-up in NSW, but this has not occurred to date, as shown in Table 3.5. As a result, we expect to continue to receive applications to connect to our network in NSW, and, as discussed, in the Overview to this access arrangement information, we have no choice but to connect these customers.

Table 3.5 Household take-up of gas (new builds and major renovations) in the NSW portion of our network

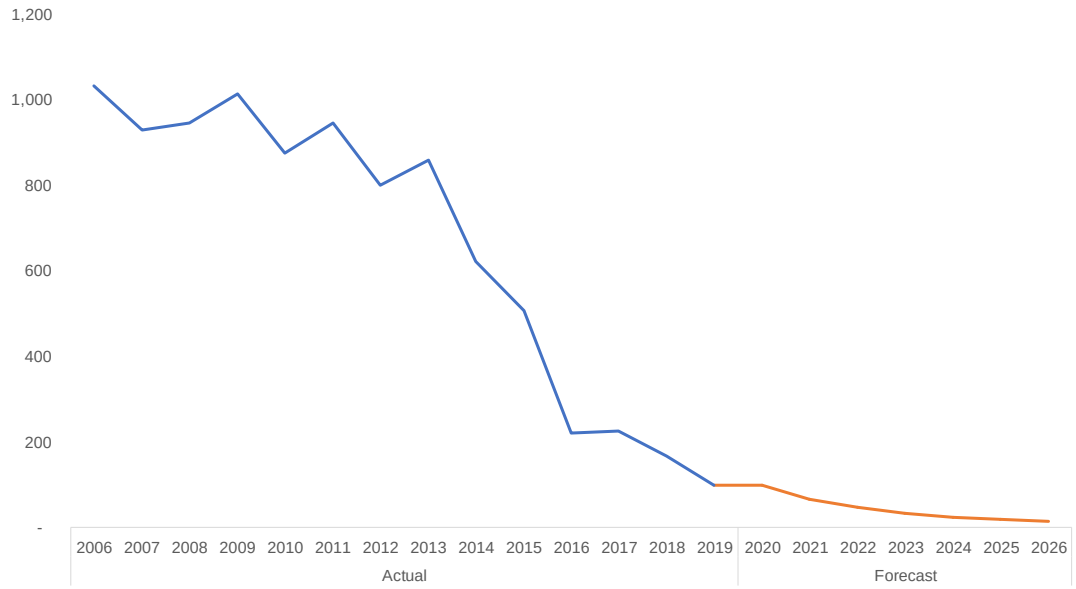
	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Proportion of households with gas	94.1%	95.6%	97.6%	95.8%	95.8%	97.2%

3.4.1 Electricity to gas

Over the last few years we have seen a dramatic fall in the number of existing homes requesting to be connected to our gas network: from 1,034 in 2005-06 to only 99 in 2018-19.

While the rate of decline has moderated in recent years, we expect it to continue over the 2021–26 period. We are forecasting to make only 15 electricity to gas conversion connections by 2025–26. This reflects the number of households who continue to prefer gas.

Figure 3-6 Electricity to gas conversions



3.4.2 Medium density high-rise

Historically, gas has captured a large share of the medium density/high-rise sector market across the ACT and in NSW. Developers have preferred centralised gas hot water plants which are cheaper, take up less space, and perform better in colder climates (where heat pumps are less efficient and require bigger plant to provide redundancy). At this stage, developers are continuing to choose gas.

However, while this has not yet translated into lost connections, developers are increasingly telling us they are looking to move away from gas – for instance through the installation of heat-pumps and solar technologies. This is likely in response to the policy direction of the ACT Government, which will likely include incentives to use electric rather than gas appliances.

Developers across Australia, such as Mirvac are embracing a new 'fossil-fuel free' mindset to achieve net positive carbon.[3] We are expecting such developers to increasingly choose not to connect their developments to gas, but it is unclear to what extent. We believe this will depend on how government policy influences the relative attractiveness of electric versus gas solutions.

[3] Mirvac, Planet positive: Mirvac's plan to reach net positive carbon by 2030, July 2019, p. 6.

Lastly, there are flow-on impacts from not reticulating new estates in the ACT. This will reduce the coverage of our network and increases the cost of connecting medium density and high-rise buildings in new estates. We expect this will have minimal impact on larger buildings (which tend not to be in new estates) but may reduce the medium density connections.

We are closely watching movement in this market segment for developments over the coming months and will update our revised proposal forecast accordingly.

3.4.3 Industrial and commercial

Our proposed Industrial and Commercial (I&C) connections capex includes a mix of capex relating to customers on I&C tariffs ($6.9 million) and customers on contractual arrangements ($4.5 million). Our forecasts of I&C tariff connections capex, as in other connections expenditure categories, are driven by our demand and unit rate forecasts. However, our experience with I&C contract connections is that they are unpredictable and expenditure can be lumpy. Due to this, our forecast of connections capex on I&C contract customers is based on a four-year historical average.

3.4.4 NSW connections

Table 3.6 below shows the breakdown of Market expansion capex between NSW and the ACT parts of the network. NSW expenditure represents about 15 per cent of all market expansion capex proposed and remains a significant driver of Evoenergy's gas market.

Table 3.6 Market expansion capex forecasts for NSW and ACT

$ million (2020/21)	ACT	NSW	Total
New homes	5.7	2.9	8.5
Medium density/high rise	6.1	0.8	6.9
Other	10.6	0.3	10.9
Total	**22.4**	**4.0**	**26.3**

*May not sum due to rounding.

Forecasting capital works

Our strategy in outsourcing routine work relating to laying mains and providing service connections for customers will remain as for the current (2016–21) access arrangement period. In particular, we have maintained the existing outsourcing strategy and framework with JAM, which allows Evoenergy's customers to leverage the synergy benefits and expertise of a large operator at incremental cost, rather than at the cost of running a relatively small, standalone gas network (see RIN Attachment 13). Our capex program forecasts these costs based on recent historical trends in our unit rates and asset volumes per customer connection. Appendix 3.5 to this attachment on our connection and meter forecasting methodology sets out the unit rates for each customer category and how these are forecast from historical costs and volumes.

3.5 Stay-in-business — network renewal capex

The *Stay-in-business — network renewal* category covers capex on our network-related items such as gas facilities, high and medium pressure mains, and district regulators.

Evoenergy's proposed capex on this category is primarily focussed on maintaining the safety of these assets as they age.

Over the course of the current (2016–21) access arrangement period, Evoenergy has been able to constrain expenditure without increasing safety or reliability risks. Within this expenditure category, there are three main projects for the 2021–26 period:

- a pressure limiting station (PLS) to maintain safety of high pressure pipelines;
- rectification of internal gas piping in shopping centres to lower the safety risk and comply with the new code; and
- the relocation and refurbishment of two Secondary District Regulator Sets (SDRSs) to ensure effective maintenance and to address increased development in their vicinity.

Table 3.7 provides a summary of these projects.

Table 3.7 Summary of major projects in the proposed capital program

Project	Project Description
Installing a Pressure Limiting Station (PLS)	This project is required to effectively manage pipeline risk due to surrounding developments. This includes facilities described as 'sensitive' under the relevant Australian Standard (eg. child or aged care facilities) encroaching in the vicinity of a high-pressure pipeline in the suburbs of Gungahlin, Throsby and Harrison. We propose to install a PLS in Watson to allow pressure in the Canberra Primary Pipeline to be reduced. This will allow the network to adhere to current pipeline standards and is the least cost option in reducing risks associated with developments near the high pressure pipeline.
Relocating our secondary district gas regulators	This project aims to improve the safety and integrity of the network**.** Two Secondary District Gas Regulators have become located in the median strip of a six-lane major arterial road, making it difficult for field staff to access and maintain assets. As a result, we propose to relocate them to a suitable location to mitigate the risks.
Rectification of internal gas piping and regulators	Projects of this nature are undertaken to maintain the safety of gas ring mains in certain shopping centres. These are determined by regular safety assessments conducted according to the relevant codes set by the Utility Technical Regulator and Australian Standards. In particular, we have set aside funding for work that is expected to be undertaken on three shopping centres during the 2021-26 access arrangement period.

3.5.1 Keeping our high pressure pipelines safe

Sections of the Canberra high pressure pipeline from Gungahlin to Phillip were first commissioned in the mid-1990s. The pipelines were constructed around the outskirts of the city and generally laid in corridors running alongside major roads. As Canberra has continued to grow, some dwellings have begun to encroach in the vicinity of the pipeline.

Evoenergy operates its gas pipelines to current Australia Standards and, although they are buried deep below ground with concrete slabs along most sections to protect against third-party damage, we want to assure the safety of the pipeline by lowering its operating pressure. Operating at the desired lower pressure level will provide an effective long term solution to maintaining safe operation as Canberra continues to grow.

The Evoenergy gas network currently receives gas from the north, near Watson, and from the east, near Fyshwick (Appendix B to the access arrangement information overview provides a network map for reference). The gas from the north is received into the network at a high pressure driven by that of the upstream pipeline (not owned by Evoenergy) according to its own pressure ratings. These pressures are at safe levels, but we want to control the Canberra pipeline at lower pressure levels than currently.

In order for Evoenergy to operate our Canberra pipeline at lower pressures than currently, we plan to construct a new pressure limiting station near our existing Watson gas facility. This new station would receive gas at the current high pressures from the north but would then lower and restrict the Canberra pipeline to a maximum operating pressure of approximately 3,500 kilopascals (kPa), down from its current maximum operating pressure of 6,200 kPa.

Figure 3.7 Inside the current Watson high pressure gas facility

3.5.2 Ensuring the safety within shopping centres via the rectification of internal gas piping and its regulators

The Evoenergy gas network has a series of different sized mains operating at progressively lower pressures. Pressures are further reduced for safety reasons to enter buildings such as shopping centres. The lower the pressure, the lower the risk, in turn, requiring larger internal gas piping to ensure supply to many commercial premises. These internal gas piping systems are known as internal ring mains.

Following on from a formal safety assessment of various shopping centres, it was mandated that existing centres with internal ring mains operating at greater than 100 kPa would be required to limit internal gas pressures to a maximum of 7 kPa or be relocated to the exterior of the buildings.

The existing higher pressure ring mains are contrary to current codes and regulations which permit no more than 7 kPa pressure to reticulate within buildings (refer to Australian Standard AS5601, Clause 5.3). As well, the Gas Service and Installation Rules (GS&I Rules), introduced by Utility Technical Regulator (UTR), state that any modification to an internal meter set would result in a requirement to relocate the meter set to an external location, for example, a rooftop, to provide optimal ventilation.

Of the nine sites originally slated for an inlet piping rectification upgrade, six sites have been completed over the current (2016–21) access arrangement period. Three more centres need to be rectified to achieve compliance to codes and regulations to ensure safety to personnel and the public. These projects require agreement between Evoenergy, the UTR, and the individual shopping centre owners, with negotiations on the actual scope of works, timing requirements and bearer of costs on certain elements of the project. Evoenergy's scope of works for these projects may include gas boundary regulator upgrades, and meter set and gas piping upgrades or relocations to external facades or rooftops.

Figure 3.8 Shopping centre regulators and piping to be upgraded

3.5.3 Ensuring the safety of technicians by relocating our secondary district gas regulators

When designing our gas network, Evoenergy aims to construct infrastructure away from populated and high traffic areas. However, over time, upgraded or widened roads and new estates may encroach on our infrastructure, altering safety margins for the public and our employees when carrying out maintenance.

Secondary District Regulator Sets (SDRSs) are small gas facilities, installed in underground boxes, that reduce pressure from the high pressure steel network and transfer gas to the medium pressure plastic pipes that supply all residential and small commercial customers. There are currently 95 SDRSs in service in the Evoenergy gas network.

We currently have two SDRSs that, after road upgrading, have become located on the median strips of major arterial roads. These specific regulator sets also have integrity issues — water ingress, deep pits and heavy steel lids — needing rectification. These issues make it difficult for field staff to access and maintain an asset exhibiting a high safety and integrity risk.

Over the 2021-26 access arrangement period, we intend to relocate these two district regulators to a suitable nearby location.

Figure 3.9 Installing a new secondary district regulator set (before and after).

3.6 Meter replacement capex

An essential part of the service Evoenergy provides is metering each customer's gas consumption. This information is used to accurately charge customers for their usage of our network and for the cost of gas (purchased and shipped by retailers).

Evoenergy's metering program aims to maintain the performance of our fleet of gas meters to ensure we:

- replace meters prior to failure to avoid estimated bills and customer frustration;
- meet our obligations to provide at least two actual meter reads every 12 months; and
- accurately bill customers to ensure network and gas usage charges are fair.

Over the current (2016–21) access arrangement period, we have been able to constrain our meter replacement capex by taking advantage of better than expected asset performance to defer replacement of residential gas meters and hot water meters. These savings were enabled by our proactive monitoring of asset performance and meter testing program.

Our forecasting approach uses revealed historical costs. In particular:

- we use actual average unit rates to forecast volume driven work (planned replacements) and apply this unit rate to the volume forecast (based on asset age profiles and performance);
- where the costs of a replacement program were steady, such as for the defective meter replacement program, we used an average of annual program costs.

Table 3.8 compares total meter replacement and renewal expenditure for the current and upcoming access arrangement periods, as well as the AER's allowance for the current regulatory period. It shows that actual spend is largely consistent with the allowance, and an increase for forecast capex. Most of this forecast spend is in residential meter capex, which is explained in further detail below.

Table 3.8 Total meter replacement and renewals capex

$ million (2020/21)	Allowance 2016-21	Actuals/Estimate 2016-21	Forecast 2021-26
Total meter replacement capex	18.1	17.4	23.6

3.6.1 Residential gas and hot water meters

Residential meter replacements make up the majority of our meter replacement costs. These include residential gas meters and residential hot water meters.

Residential gas meters operate using diaphragms which inflate and deflate as gas passes through. These diaphragms are connected to levers which power an internal odometer-like device to record consumption. Over time, these internal components wear, leading to measurement inaccuracy. We regularly test our gas meters to ensure they continue to provide accurate readings and replace those found to be inaccurate.

Evoenergy also offers residential hot water meters for high-rise buildings with centralised hot water systems. Under existing arrangements, we measure how much hot water is used by each individual dwelling and this information is then used to bill each dwelling for the gas used by the centralised hot water system.

Table 3.9 compares the proposed level of capex for residential meters (and associated equipment such as Meter Data Loggers) with the AER's allowance and historical actuals.

Table 3.9 Residential meter capex

$ million (2020/21)	Allowance 2016-21	Actuals/Estimate 2016-21	Forecast 2021-26
Total residential meter capex	14.5	14.6	18.5

Actual spend for the current period is consistent with the AER's allowance, but the forecast spend is around $4 million higher due to the significant part of the population of meters that is considered to have already reached end of life due to results from meter sample testing. This creates a backlog for management and replacement, and the forecast spend reflects this.

Residential gas meters are statistically sampled prior to 15 years of service in accordance with the requirements of Australian Standard AS4944. A sample of residential gas meters is removed from service and tested two years prior to reaching 15 years of service. It is expected that these meters will be approved for a five-year life extension with the additional opportunity to include testing to attain a subsequent life extension at 20 years. However, the statistical sampling testing will provide actual replacement requirement volumes.

In addition, hot water meters are generally installed together with accompanying Meter Data Loggers (MDLs) which record consumption for each dwelling at a central point. The main benefits of MDLs is to realise efficiencies from avoiding individual visits to each dwelling in a building to read a meter. MDLs allow this to be avoided by sending consumption information back to us electronically. Hot water meters communicate with the MDL by sending pulses to indicate how much hot water is consumed. For the 2016–21 regulatory period, there may be a concern about the current technology as it is twenty years old with vendor support uncertain. Our approach is to continue to bear this risk for as long as possible to contain costs.

3.6.2 Industrial and commercial meters

We have a variety of gas meters for our Industrial and commercial (I&C) customers who use larger than average volumes of gas. Each customer is supplied with a meter that is appropriately sized for how much gas they use. Table 3.10 below compares the proposed level of capex for I&C meters with the AER's allowance and historical actuals.

Table 3.10 Industrial and commercial meter capex

$ million (2020/21)	Allowance 2016-21	Actuals/Estimate 2016-21	Forecast 2021-26
Total industrial and commercial meter capex	3.6	2.9	5.0

The increase in forecast capex is due to an increased number of meters reaching end of life. In some instances, we have been able to extend asset life but allowing adequate expenditure for replacement is critical as meter failure and inaccuracy can have serious consequences due to the large volumes of gas involved.

Shortened forms

Term	Meaning
AA	Access Arrangement
ACT	Australian Capital Territory
ACT climate change strategy	ACT Government's Climate Change Strategy 2019-25
ACTCOSS	ACT Council of Social Service
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ANU	Australian National University
ARENA	Australian Renewable Energy Agency
BISOE	BIS Oxford Economics
CABS	A Jemena Ltd proprietary system providing retailer billing, demand customer management, network balancing and retailer nomination services.
CALD	culturally and linguistically diverse (community)
capex	capital expenditure
CCP, CCP24	the AER's Consumer Challenge Panel (number 24)
CEG	Competition Economists Group
CEPA	Centre for Efficiency and Productivity Analysis (University of Queensland)
CESS	Capital Expenditure Sharing Scheme
CIE	Centre of International Economics
CIT	Canberra Institute of Technology
CPI	consumer price index
DAE	Deloitte Access Economics
DAMS	Distribution asset management services (agreement)
DC	Demand Capacity Tariff
DT	Demand Throughput Tariff
E2G	Electricity-to-gas
EEIS	Energy Efficiency Improvement Scheme
ECM	Efficiency Carryover Mechanism
ECRC	Energy Consumer Reference Council
EGWWS	electricity, gas, water and waste services (sector)
EI	Economic Insights
EIL	Energy Industry Levy
ETC	Estimated cost of corporate income tax
EPSDD	ACT Environment, Planning and Sustainable Development Directorate

Term	Meaning
GDBs	gas distribution businesses
GN21	Evoenergy gas network access arrangement 2021–26
GJ	gigajoule = 10^9 joules
GWh	gigawatt hour
I&C	Industrial and commercial
ITAUF	Information Technology Asset Utilisation Fee
km	kilometre
kPa	kilopascal
LPG	liquid petroleum gas
MDLs	Meter Data Loggers
NGL	National Gas Law
NGO	National Gas Objective
NSW	New South Wales
opex	operating expenditure
PFP	Partial Factor Productivity
PJ	petajoule = 10^{15} joules
PLS	Pressure Limiting Station
PPA	power purchase agreement
PTRM	post-tax revenue model
QPRC	Queanbeyan–Palerang Regional Council (local government authority)
RAB	regulatory asset base
RFM	roll-forward model
RIN	Regulatory Information Notice
Rules	National Gas Rules
SDRS	Secondary District Regulator Set
TAB	tax asset base
TJ	terajoule = 10^{12} joules
UAG	unaccounted for gas
UNFT	Utilities Network Facilities Tax
VB	Volume Boundary (tariff class)
VI	Volume Individual (tariff class)